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ABSTRACT

This booklet presents a pupil-oriented program designed to increase the environmental literacy of teachers and students in Indiana schools through a programmed multiplier effect. Junior and senior high school science teachers were prepared to teach students the meanings of 44 selected environmental terms and related concepts. Those teachers then selected students from their own secondary level classes to act as tutors for elementary school children. After preparation, the student tutors taught the 44 environmental terms and concepts to the younger students. The project was designed to increase the understanding by teachers and pupils of environmentally important terms or expressions. Other objectives were to prepare a cadre of environmentally literate teachers who would continue the project, to develop inexpensive environmental teaching materials, and to provide a model for the inexpensive implementation of environmental literacy in the schools. The interdependence of human values, energy resources, and the environment was emphasized. A description of the project and evaluative comments are included in this report. An appendix lists the personnel involved in the project and includes sample materials. (Author/MA)

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ED146051

MULTIPLIED ENVIRONMENTAL LITERACY

INDIANA STATE UNIVERSITY

Terre Haute, Indiana

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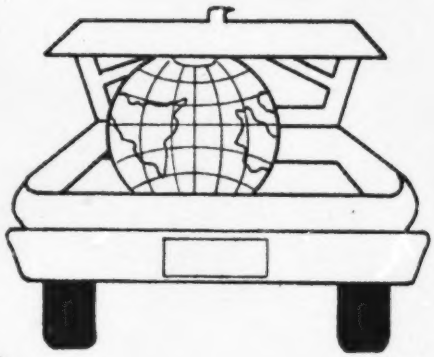


We Treat the Earth as if We Have a Spare in the Trunk.

Final Report

1976-1977 U.S.O.E.

Office of Environmental Education

Grant # G0076020241

Project Director:

Chris Buethe
Professor of Education
Indiana State University

SE 023 270

Acknowledgment

The author is indebted to the United State Office of Education, Office of Environmental Education, for supporting and encouraging the participation of Indiana State University and schools of Indiana in the project Multiplied Environmental Literacy.

Members of the M.E.L. Advisory Committee, including a representative of the Indiana State Department of Public Instruction, contributed significantly to the project.

Jerry D. Brown served as a tireless and creative assistant.

The enthusiasm and interest of the science teachers and students who participated in the project assured the success achieved.

INTRODUCTION

The 1976-1977 project Multiplied Environmental Literacy at Indiana State University was a pupil-oriented program designed to increase the environmental literacy of teachers and students in Indiana schools through a programmed multiplier effect. Cooperating agencies included the School of Education and the science departments of Indiana State University, the State Department of Public Instruction of Indiana, and Indiana School Corporations.

A core population of junior high and senior high school science teachers was prepared to teach students the meanings of forty-four selected environmental terms and related concepts. The environmental terms chosen for the project emphases were selected by a six-member Advisory Council of environmental experts, each of whom was a highly experienced and qualified environmental education specialist. Fifty teachers were selected for the project upon the basis of expressed interest, experience, and relative geographic convenience. Forty-five of the fifty completed at least the minimal goals of the project, while five dropped out for reasons ranging from new professional assignments to loss of job.

Multiplied Environmental Literacy was originated in order to multiply the effectiveness of teachers through the utilization of their selected secondary level tutors. These tutors taught important but relatively misunderstood environmental terms and concepts to younger children, many in grade four or below.

The project was designed principally to increase the understanding by teachers and pupils of environmentally important terms or expressions

like "biodegradable" and "energy efficient". Secondary objectives of the project included the preparation of a cadre of environmentally literate teachers who would continue the project, to develop inexpensive environmental teaching materials, and to provide a possible model for the inexpensive implementation of environmental literacy in Indiana and U.S. schools. The interdependence of human values, energy resources, and the environment was emphasized.

MULTIPLIED ENVIRONMENTAL LITERACY

The Multiplier Cascade

PHASE I (1976-1977)	Staff 6 Advisors 44 Selected Terms. 45 Science Teachers Prepared 298 Secondary Science Students to Tutor 6,642 Younger Pupils on the Project Terms and Concepts
PHASE II (1977-1978)	With 40 new science teachers, 5 Effective Participant-Teachers From Phase I will Utilize System, Materials, and Insights along with Indiana Higher Education Television System to Further Multiply Environmental Literacy in Indiana Elem. & Sec. Schools.
PHASE III	Continuing Progress in Project M.E.L. Expected to Lead to Further Evaluations Plus U.S. Dissemination of the Model and of Practical Results.

The Multiplied Environmental Literacy Program

In approximate order, during the 1976-1977 academic year, the following activities were completed in project M.E.L.:

The director, with the aid of the Indiana State Department of Public Instruction, selected cooperating school districts, beginning with all schools in close geographic proximity and concentrically extending to greater distances. Approximately 80% of the school districts contacted nominated science teacher participants for the projects. Three individuals from distances over 100 miles who heard about the project from project personnel nominated themselves and were also invited to participate. In all, fifty-four teachers were invited, fifty began the project, and forty-five completed it.

The director, project assistant, and six-member advisory council, utilizing the results of a previous Indiana statewide study by C. Buethe, (1975) selected forty-four vocabulary terms and related concepts, rank ordering their importance to the project. The set of 44 terms became the principal basis of the planned activities of the project.

The director and his assistant developed tests over the 44 basic terms which were utilized with teachers and pupils.

Two full Saturday seminar-workshops were held for the teacher participants. Briefly, the following indicate the principal foci of the two days:

September 25

Orientation, Pretest
Evaluation feedback
"Water" - J. Corrigan
"Air Pollution Control" - D. Sapp
"The Energy Connection" - R. Llewellyn
Discussion, Materials distribution

November 6

Progress reports
"Resources & Population" - C. Gehring
"Environmental Literacy Workbooks and
Projects" - M. Parks, J. Wright
"Land Use Problems" - J. L. Guernsey
Demonstrations, materials, - J. D. Brown et.al.

Leading environmental educators and suppliers throughout the U.S. were contacted for materials and ideas that were likely to be useful in the project. Packets of materials were later mailed or directly delivered to teacher participants to support their local efforts; where possible, attempts were made to match teacher requests and local problems to materials supplied. Active teachers who requested help or materials were assisted most.

An outside evaluator worked with the director and assistant for one day, suggesting means of checking project worth and effectiveness. Although many evaluator suggestions were utilized, it was also apparent that more meaningful evaluations could have resulted from earlier project planning and emphasis in that area.

After the second of two Saturday training sessions, the junior high and senior high school science teachers who served in the project returned to their schools, each to select two or more capable and/or interested science students to serve as project tutors. Teachers and tutors were encouraged to "do a few things well" with a large number of children, utilizing local options within the set of 44 basic environmental terms.

While 100 to 150 tutors had been expected, 298 tutors took part. In part, the gain in tutors came from the involvement of entire science clubs or advanced science (usually biology) classes in the program.

Tutors, upon being trained and in most cases pre-tested and post-tested by their teachers, prepared lessons and materials, and were scheduled to serve as visiting tutors to individuals, small groups, or entire classes, usually at the elementary level. Although actual tutoring of individuals and small groups was strongly encouraged by the director, conventional classroom settings encouraged mainly whole-class instruction by M.E.L. tutors. The tutors often worked in teams or pairs, building to their own strengths and providing each other moral support.

Nearly nine thousand pupils were reached by the combined multiplier effects of project Multiplied Environmental Literacy, and a number of serendipitous results were produced. An analysis of those results follows.

Of the fifty secondary school science teachers who had initially agreed to take part in Project Environmental Literacy, forty-five completed at least the minimums of the project objectives. In each case, at least two science pupils were trained by their teacher to serve as tutors of younger children in locally selected segments of the project content. Since local options were used, and indeed were strongly encouraged by the project staff, few opportunities became available to make meaningful comparisons between the results of different teachers or different schools. Rather, each teacher was asked to be responsible for the qualitative, and where applicable, the quantitative evaluation of his/her local and inherently different project.

In some cases, teacher participants were unusually productive in carrying out project goals. Where possible, their work was given extra support in time and materials by the project staff.

The following table indicates the quantitative multiplier effect of the number of project participants:

Table I

NUMBER OF M.E.L. PARTICIPANTS

	Expected	Actual
Science Teachers	40- 60	45
Science Student-Tutors	100	298
Pupils Tutored	2,400-3000	6,642
Total Participants	2,540-3160	6,985

As indicated above, the actual number of tutors who assisted with the project was 198% greater than had been expected, and the actual number of younger pupils tutored was at least 121% greater than had been anticipated in the project. Hard data was not collected regarding host teachers, parents, and others who were involved in project support, although that support was evident from teachers' comments.

It is apparent that a significant multiplier effect in the number of individual learners was achieved, in that 3,840 more students were active in the project than had been expected.

Teacher participants were encouraged to use a multiple choice test prepared for the project, as well as a vocabulary recognition check based upon the forty-four basic project terms. Some teachers chose to work thoroughly with only a small fraction of the forty-four terms, while others utilized all or most of the terms, seeking only recognition-level

familiarity with the vocabulary. Typically, twenty terms were selected for local use, with a view toward community environmental problems and the special interests of local teachers and students. Evaluations at the local school level reflected the choices made. Results reported by individual teachers are shown in capsule form in Table II. The spectrum of results ranges from the relatively unsophisticated to rather complex and scholarly. Direct comparisons, between reported results can not validly be made; even where the recognition of twenty terms was reported in two different situations, it is not assumed that exactly the same 20 terms were used in each setting.

Table II

M.E.L. Results

TEACHER NUMBER	NUMBER STUDENTS	NUMBER OF TUTORS	PRE-TEST MEAN	POST-TEST MEAN	NUMBER OF TERMS
1	80	2	4.0	6.0	7
2	60	4	DM*	DM	DM
3	150	4	11.9	16.3	20
4	424	9	11.5	18.1	20
5	DM	DM	DM	DM	DM
6	160	18	DM	DM	DM
7	192	6	9.0	17.0	20
8	84	6	9.0	13.6	20
9	418	3	11.0	14.6	20
10	109	12	3.0	9.0	12
11	106	5	12.0	32.0	44
12	70	7	9.5	14.0	20
13	158	4	7.6	15.5	20
14	140	4	6.5	8.8	10
15	DM	21	DM	DM	DM
16	96	3	9.4	13.8	20
17	25	3	DM	DM	DM
18	192	6	9.0	17.0	20
19	DM	3	DM	DM	DM
20	335	14	9.0	15.9	20
21	180	2	6.0	13.9	23
22	240	2	9.0	17.0	20
23	DM	4	DM	DM	20

*DM = Data missing.

TEACHER NUMBER	NUMBER OF STUDENTS	NUMBER OF TUTORS	PRE-TEST MEAN	POST-TEST MEAN	NUMBER OF TERMS
24	DM	DM	DM	DM	DM
25	DM	DM	DM	DM	DM
26	80	27	3.3	4.8	7
27	196	12	9.1	17.3	20
28	180	16	4.6	8.4	10
29	90	4	9	18	20
30	80	2	DM	DM	DM
31	180	16	4.6	8.4	10
32	324	10	8.7	10.7	12
33	168	4	3.8	5.9	10
34	DM	DM	DM	DM	DM
35	325	10	8.7	10.7	12
36	140	7	1.0	5.0	7
37	180	6	10.6	14.8	20
38	581	27	34.0	41.0	50
39	324	10	8.7	10.7	12
40	120	3	14.0	19.0	40
41	70	7	13.0	26.0	40
42	150	6	11.6	21.2	30
43	DM	DM	DM	DM	DM
44	180	9	4.0	7.0	9
45	325	10	8.7	10.7	10

Only a handful of administrators blocked the pupil tutoring plans in their schools. In most cases, assertive teachers were able to find pupils somewhere (even in their own school buildings) in order to complete the project intent regarding cross-age tutoring.

One spinoff* of the project that proved to be particularly attractive to children was the radio controlled robot developed by assistant J. D. Brown with the aid of participating teacher J. Mansfield. The 5 ft. robot "MEL" was programmed with flashing lights and on-board cassette tape on selected project content. "MEL" addressed 1,968 children and adults in six schools and at two teachers' conventions. In addition, he appeared on television in two states and "walked" the campus at Indiana State University to publicize the annual campus environmental day.

One view of the project's effectiveness is found by dividing the number of pupils who were involved in the level of being pre and post-tested about project content into the total cost paid by the grant from the U. S. Office of Education. The per/student cost of the program was less than $2.64, based upon conservative estimates of the numbers of students reached. i.e./18,322/6,940.

Two unsolicited quotes are included, to indicate some of the important results of the project that defy measurement:

> Teacher, School X:
>
> "I think your program is very effective. I am going to continue to be a multiplier; and, one of my fellow science teachers has also started an environment program in the seventh grade classes...."

*See Appendix for selected examples of spinoffs.

Tutor, School Y:

"As an individual student in the MELP (sic), I believe that this phase of the science course has been the most interesting of any science I have taken in my education life.... I feel that MELP should be offered in even a larger scale in future sessions to come..."

The result of the first year of project Multiplied Environmental Literacy is that a few dozen of Indiana science teachers have multiplied the environmental literacy of thousands of pupils through student-tutors. Special innovations have been produced that may be useful in further environmental teaching. Some teachers and students have volunteered to continue efforts in environmental education via the second year of the project, MEL-II.

Summary

The first phase of the intended three-year project, Multiplied Environmental Literacy, has resulted in a great variety of activities in environmental education involving Indiana school children. Teachers have enthusiastically enlisted selected science students as "tutors," usually employing them as teams of teacher aides. Measured gains with non-standardized tests over the project content are seen as encouraging, but not definitive. The enthusiastic and continuing participation of many science teachers and their students is viewed more positively, and when combined with the special innovations of the project that have come from teachers, pupils, and project staff, form the basis of expected success in the second phase of the project. Project M.E.L. has been even more successful than had been anticipated.

The project has been recognized through various Indiana media, and has resulted in two invited conference presentations to date. At least two issues of the Hoosier Science Teacher have included articles that have come directly from the project; an ERIC report is also based upon it. The Association for Supervision and Curriculum Development (ASCD) has confirmed the inclusion of a special session at the next national convention that features M.E.L. along with another state's exemplary program. Elements of the project will be utilized in a planned interdisciplinary program in western Indiana. Cartoons from the project have been submitted to two journals and to a regional newspaper. These and other extensions of M.E.L. are expected to broaden the recognition of this joint venture of the Office of Environmental Education and Indiana State University.

APPENDIX

M.E.L. Staff Personnel

Director: Dr. Chris Buethe
Professor of Education
Indiana State University

Project Assistant: Mr. Jerry D. Brown
Doctoral Candidate
Indiana State University

Advisors and Lecturers

Dr. John J. Corrigan
Associate Dean, Arts and Sciences
Indiana State University

Dr. Charles L. Gehring
Associate Professor of Life Sciences
Indiana State University

Dr. James L. Guernsey
Professor of Geography
Indiana State University

Dr. Dennis Sapp
Manager, Custodis Construction Engineering Research
Terre Haute, Indiana

Dr. Ralph A. Llewellyn
Professor of Physics
Indiana State University

Dr. Marshall E. Parks
Associate Professor of Science Education
Indiana State University

Mr. Joe Wright
Environmental Education Consultant
State Department of Public Instruction, Indiana

Evaluation Consultant

Dr. Harold Harty
Professor of Education
Indiana University

Staff Artist

Cathy Larr Warner

Video Producers

Martin Conner
Howard Espravnik

Secretaries

Ann Monroe
Vera Yeager
Dawn Sluder
Vickie Blanford

M.E.L. Participants

NAME	SCHOOL/LOCATION
Blair, Donald	Tuttle Junior High School - Crawfordsville
Bolinger, Zelma	Otter Creek Junior High School - Terre Haute
Borders, Carl	Shakamak High School - Jasonville
Brooks, Jonathan	Rosedale High School - Rosedale
Campbell, Russell	Rockville High School - Rockville
Cartwright, Clifford	Otter Creek Junior High School - Terre Haute
Conde, Norman	Farmersburg Junior High School - Farmersburg
Costello, Prisilla	I.S.U. Laboratory High School - Terre Haute
Crooks, Rhonda Kay	Dugger Elementary School - Dugger
Engle, Walter -	Terre Haute North Vigo High School - Terre Haute
Fields, William	Woodrow Wilson Junior High School - Terre Haute
Fusco, Carol	Hymera Junior High School - Hymera
Greenlee, Claud	Covington Middle School - Covington
Grossnickle, Dennis	Seeger Memorial High School - West Lebanon
Hagerman, Peggy	North Central High School - Farmersburg
Harmon, Gerald	Turkey Run High School - Marshall
Henderson, Martha	I.S.U. State High School - Terre Haute
Henry, Bryan	Chauncey Rose Junior High School - Terre Haute
Hoffman, Gerald	I.S.U. State High School - Terre Haute
Kane, Kevin	North Vermillion High School - Cayuga
Kelley, Paul	Terre Haute South Vigo High School - Terre Haute
Kite, Larry	North Vermillion High School - Cayuga

NAME	SCHOOL/LOCATION
Konopasek, James	Towell High School - Griffith
Mansfield, Jarold	Terre Haute South Vigo High School - Terre Haute
Maurer, Judith	Brazil Junior High School - Brazil
McCory, John	Fort Wayne High School - Fort Wayne
McCullough, Carol	Brazil Junior High School - Brazil
Metcalf, Danny	Linton-Stockton Junior High School - Linton
Meyers, Virginia	Brazil Junior High School - Brazil
Mooney, William	I.S.U. High School - Terre Haute
Moore, Stephen	Terre Haute North Vigo High School - Terre Haute
Murphy, Francis	Princeton Community High School - Princeton
Partezana, Richard	Covington Junior High School - Covington
Patrick, Randy	Southmont Junior High School - Crawfordsville
Rivers, Sandra	Mt. Vernon Junior High School - Mt. Vernon
Rodgers, Charles	Chauncey Rose Junior High School - Terre Haute
Schad, William	North Putnam Community High School - Roachdale
Sheese, James	Brazil Junior High School - Brazil
Slaven, Steve	Winamac Middle School - Winamac
Sullivan, Leona	Otter Creek Junior High School - Terre Haute
Sweeten, Jerry	Attica Junior High School - Attica
Vencel, Lloyd	Mt. Ayre Junior High School - Mt. Ayre
Wakefield, Wayne	Linton-Stockton Junior High School - Linton
Waugh, Robert	South Vermillion High School - Clinton
Wernz, Ben	Woodrow Wilson Junior High School - Terre Haute

MULTIPLIED ENVIRONMENTAL LITERACY

Part A: ENVIRONMENTAL TERMS:

Directions: For each of the 44 terms listed below, indicate your present degree of understanding in relation to your physical environment. On the separate answer sheet, shade in the space below the letter which corresponds to the BEST answer.

A. I know what the term means.
B. I recognize the term, but I don't know what it means.
or C. I have never heard of the term.

E.G./ "Energy" (I know that energy is the capacity to do work),

therefore,

A B C

1. biodegradable
2. photosynthesis
3. solar energy
4. biosphere
5. ecology
6. environment
7. fossil fuel
8. food chain
9. greenhouse effect
10. hydrocarbon
11. reclamation
12. watershed
13. energy efficient
14. E.P.A.
15. nuclear generator (reactor)
16. temperature inversion
17. closed system
18. decibel
19. effluent
20. gasification
21. green belt
22. herbicide
23. mineral
24. ozone
25. particulate
26. precipitator
27. runoff
28. sulfur dioxide
29. adaptation
30. cycle(s)
31. leaching
32. organism
33. plankton
34. scrubber
35. aeration
36. biophysical
37. bituminous
38. ERDA
39. ERTS
40. stewardship
41. SST
42. convenience product
43. water rights
44. pesticide

ENVIRONMENTAL UNDERSTANDING: A SELF-TEST (Sample)

Directions: Circle the letter that corresponds to the BEST answer in each case.

1. The first one of these to decay when buried in the ground is a(an)

   A glass bottle
   B "tin" can
   C aluminum can
   D plastic bottle

2. The study of living things and the way they live in their surroundings is called

   A environment
   B ecology
   C geometry
   D geography

3. Closest to the sun in the "food chain" is the protein in

   A beef
   B eggs
   C beans
   D cheese

4. A person can destroy part of his hearing by often

   A listening to loud music
   B driving large tractors
   C doing either of these
   D neither of these

5. Which of these activities would help most to reduce pollution?

   A Adults should ride bikes.
   B Children should eat natural foods.
   C Dogs should be kept on leashes.
   D Clothing should be washed with soaps instead of detergent.

6. Almost all the energy we use on the earth comes from (the)

   A water
   B sun
   C atmosphere
   D dirt

7. Of these, the poorest way to save fuel in homes is to

   A use fireplaces
   B use gas heat
   C turn thermostats down nights
   D insulate homes

8. Shale oil recovery is most closely related to problems of environmental management in (the)

   A off-shore Gulf of Mexico
   B Colorado mountains
   C Alaskan tundra
   D North Atlantic Ocean

9. Much water that runs down the Wabash River comes from

   A rain in Illinois
   B rain in Kentucky
   C snow in Ohio
   D snow in Michigan

10. Of these auto speeds, the most efficient for gas mileage is

    A 10 miles per hour
    B 35 miles per hour
    C 55 miles per hour
    D 70 miles per hour

11. Of these sources of energy, the principal US supplier in the year 1990 will be

    A nuclear plants
    B solar space stations
    C geothermal heat pumps
    D petroleum

12. The people of Indiana (approximately 1/2000 of the world's population) use approximately the following fraction of the world's fuels:

    A 1/2000
    B 1/1000
    C 1/500
    D 1/100

SPECIAL INNOVATIONS OF M.E.L.

The following is an incomplete list of "spin-offs" produced by project Multiplied Environmental Literacy, indicating a high level of creative productivity on the part of staff and participants at all levels. (*asterisk denotes sample follows)

*Fifteen minute color videotape on pollution
Environmental glossary for children
Coloring book on local environmental problems
*Remote controlled robot (MEL) who talks to children
*Puppets depicting environmental terms (e.g./sun dragon)
*Poems
*Games
*Cartoons
Script for Play
Slides (e.g./from airplane, on local water pollution)
Song (original, tape recorded)
Poster for children, depicting terms of project
Solar energy slide-tape series
"Coal, Black Energy" slide-tape series
Illustrated "Think Book"

SAMPLE M.E.L. POEMS, GAMES, AND STORIES

- by Cathy Larr Warner

SEARCH

The word list contains 30 terms.
Can you find them all in the diagram?
...

X U S E B I O D E G R A D A B L E N V

R P I S C T P Q Z D E C I B E L I O T

...

Herbicides

Herbicides are farmers' tools
They help keep crops alive.

They keep the weeds
From growing up
And choking crops, besides.

Make a Watershed

Materials: cardboard, stapler, aluminum foil, large sink or outdoors, sprinkling can, water.

Make a triangular tent shape of the cardboard by bending a square of it in half...

... See if you can locate some divides on a map of the U.S.

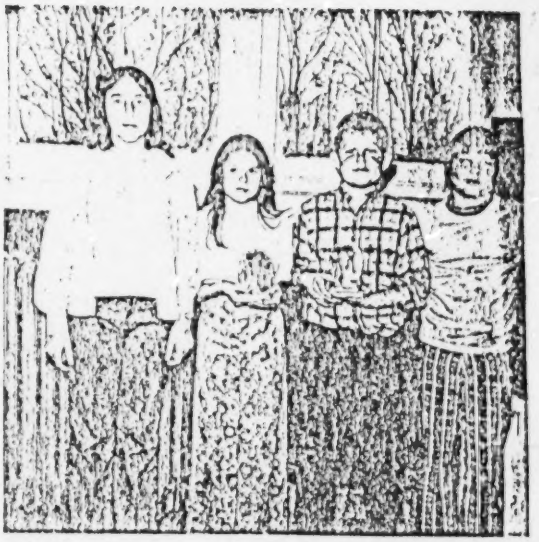
Night of the Ozone

Cast: Narrator
Herb
Joe (Three young brothers)
Jack

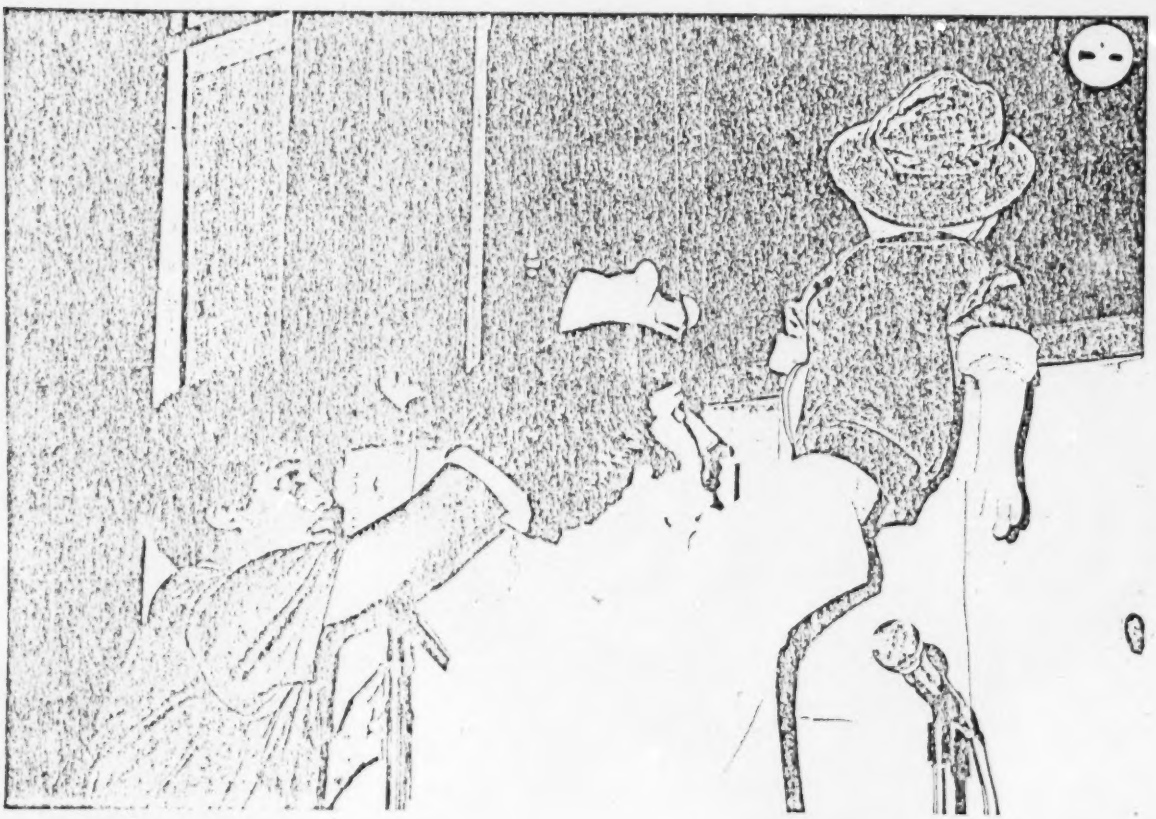
Narrator: It was a dark and stormy night. The wind howled through the trees and the white veins of lightning pulsated in the black of the sky. Meanwhile, down on the farm, the children hid their heads underneath the covers...

Sun Dragon Puppet

Materials: Orange felt 1/4 yard, blue denim 1/4 yard.
Yellow yarn, scraps of white, pink and blue felt.
Two buttons that resemble eyes.
...
Sew centers of 8" strands of yellow yarn to dart seams on top of the head and to the chin...
Full head of yellow "hair" and "beard" may be combed to look fuzzy...



North Vermillion Students Changed Aluminum Cans Into School Emblems



Princeton Tutors Videotaped an Environmental "Special"

MEL ROBOT TELLS HOW - MEL Robot tells young students at Dixie Bee School about environment and ener... Giving full attention here are students in the 6th grade class of Mrs. Cafolyn Diss. (left to right) Pam Simpson, Craig Stephenson (one of the developers of MEL), Tim Jessell, Gary Figg and Craig Collyer (kneeling). (Photo

MEL Robot Makes First Appearance

By ELIZABETH CIANCONE
Star Staff Writer

Approximately 40 students from Dixie Bee Elementary, Sch... were exposed to the ultima... programmed learning Thursday afternoon when a five-foot aluminum robot named MEL (Multiplied Environmental Literacy) presented an 18 minute program complemented with a slide presentation and concerned with basic terms used when talkin' about environmental and energy problems.

MEL, whose chest lights up with a built-in name tag, was developed by graduate student Jerry Brown Sullivan, a graduate student ... Indiana State University, with the as... from a survey conducted by Dr. Chris Buethe, chairman of the secondary education department at ISU. The survey showed that teachers in Indiana did not have a good working knowledge of environmental terms, problems or current energy needs.

On the basis of survey findings, Dr. Buethe was awarda grant from the U.S. Office of Education for the purpose of developing a two-part workshop to aid teachers in improving their own knowledge concerning the environment and also to help them develop new techniques to teach elementary and secondary students about current ecological and energy problems.

Hence MEL. MEL is certain-

Special Environmental Program at Otter Creek

Otter Creek Junior High School is participating in a special project co-sponsored by the United State Office of Education and Indiana State University called, "Multiplied Environmental Literacy."

The project, designed to enhance the understanding of man toward environmental damage, will require ninth grade teachers to exchange classes with sixth grade teachers.

Under the supervision ... Cartwright, ... students Cry... Pollock, ... Kallis, Gary ... Nelson Oxman ... with 110 sixth grade ... th grade teachers ... with the project ... Mrs. ... Rose, Mrs. ... Donald Shepperd and ... Shanks.

Mrs. Leona Sullivan ... ing student instructo... Gerdink, Jeff Lough and ... Watson. These students ... tutor Mrs. Garrett's ... grade class. Mrs. ... Bolinger is assisting ... Ennen, Chris ... and ... Weinright so these students ... work with sixth grade ...

Dr. Chris Buethe at ... State University is ...

M.E.L. Teaching
by Cartoons

with Eartha,
Terrance,
and Runoff

EARTHA, the Hoosier School Child RUNOFF

FOOD CHAIN

Terrance, tell me all about food chains
Well, There's Burger chef, McDonalds, Burger King...
Not quite. You know what I mean!
Isn't a chain ! when Fre fox eat Billy - and.

Hydrocarbon

Miz Crosby, Do hydrocarbons bite?
No, indeed. Hydrocarbons are found in natural gas and in petroleum
Many petroleum products are mixtures of hydrocarbons.

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Indiana State University

Certificate of Appreciation To

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In recognition of participation and support

1977 Project MULITIPLIED ENVIRONMENTAL LITERACY

Dean, School of Education

Project Director

President of the University

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